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discovery of a vestigial sixth branchial arch in the shark, Heterodontus. As in the more primitive groups of Hexanchidæ and Chlamydoselachidæ, there are six or seven gill arches, this discovery of six arches in the still more ancient group of Heterodontidæ, the oldest of existing sharks, is a matter of much interest and importance. The number five found in all other recent sharks is apparently a matter of specialized reduction.

In the *Annals of the New York Academy of Sciences*, 1906, Dr. Raymond C. Osburn makes a strong and convincing argument for the theory of the origin of the vertebrate limbs from fin folds. Dr. Osburn contends that paired and unpaired fins in fishes are similar structures and that the evidence is overwhelmingly in favor of the origin of all fins as local outgrowths from the body wall.

DAVID STARR JORDAN

BOTANY

Leaf Structure.—A paper by Mrs. Clements,[1] which contains a historical review of the work previously done along similar lines, is based upon observations made on some 300 species growing under the varied conditions presented by the Colorado foothills and the mountains of the Pike's Peak region of the Rocky Mountains. The conclusions arrived at support the views now generally held as to the influence of local conditions upon the histological structure of leaves, and are based upon exceedingly extensive and precise measurements relating to water-content of soil, humidity, light, and temperature, all of which factors are brought into relation with the histological structure of stem leaves. Thanks to the system of classification adopted as well as to the numerous comparative tables, the reader, at a glance, is able to note with exactitude the influence of each of the factors upon leaf structure, in which he is aided by a large number of excellent illustrations.

The statement: "Full sunlight is equally strong throughout the regions, and not more intense for high altitudes, as is generally supposed" [p. 28] is to be noted, in view of Professor Wiesner's recent conclusions to the contrary.

H. HUS

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[1] Clements, E. S. "The Relation of Leaf Structure to Physical Factors." *Trans. Amer. Micr. Soc.*, 1905, pp. 19–102, 9 pls.